

REMARKS

Claims 1-14 are currently pending in the application, with claims 5, 6, and 12-14 being withdrawn from consideration by the Examiner. By this response, no claims are amended, added, or canceled. Reconsideration of the rejected claims in view of the following remarks is respectfully requested.

Objection to Specification

The specification has been objected to under 35 U.S.C. §132(a) for allegedly introducing new matter into the disclosure. This objection is respectfully traversed.

The Examiner asserts that the substitution of paragraph 0018 with paragraph 0018.1 in the Preliminary Amendment dated April 17, 2006 introduces new matter into the disclosure. Applicants respectfully disagree.

Applicants initially note the Examiner's mischaracterization of amended paragraph 0018.1 being substituted for paragraph 0018. Applicants wish to clarify that amended paragraph 0018.1 was entered to follow original paragraph 0018, not to replace it.

Applicants submit that the material added to the specification by the Preliminary Amendment is not new matter because it is supported by the original disclosure of the application. More particularly, the text of paragraph 0018.1 is substantially identical to claims 1-6 as originally filed. MPEP §2163.06, in discussing new matter situations (including 35 U.S.C. §132), states that:

... information contained in any one of the specification,
claims or drawings of the application as filed may be added

to any other part of the application without introducing new matter.

The material identified by the Examiner was contained in the claims as originally filed. As such, this material may be added to any other part of the application without introducing new matter. Should the Examiner wish to maintain this rejection, Applicants request that the Examiner specifically identify instances of new matter so that this rejection may be adequately addressed.

Accordingly, Applicants respectfully request that the objection to the specification be withdrawn.

35 U.S.C. §101 Rejection

Claims 1-4 and 7-11 were rejected under 35 U.S.C. §101 as allegedly being directed to non-statutory subject matter. This rejection is respectfully traversed.

The Examiner asserts that "the claimed method is nothing more than a series of mathematical and/or computer-based matrix operations without finally getting around to operating the nozzles". The Examiner further asserts that the claims "[do] not seem to implement the results of the control method in any manner (i.e., applying the control solution to the recited nozzle matrix to effect the desired torque/force results of a vehicle)...". Applicants respectfully disagree.

Contrary to the Examiner's assertions, Applicants submit, if the method recited in the pending claims is statutory (which is shown below), it is immaterial whether the results of the method are subsequently used or implemented.

Applicants submit that claims 1-4 and 7-11 are indeed directed to statutory subject matter when the claims are considered in view of the "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" set forth in the Official Gazette of the United States Patent and Trademark Office, dated November 22, 2005 (Volume 1300, Number 4) (hereinafter referred to as the "Guidelines").

The following passages from the Guidelines describe the current standards for statutory subject matter:

To be eligible for patent protection, the claimed invention as a whole must be useful and accomplish a practical application. That is, it must produce a "useful, concrete and tangible result." *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 149 F. 3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998).

....

To be statutory, a claimed process must either: (A) result in a physical transformation for which a practical application is either disclosed in the specification or would have been known to a skilled artisan, or (B) be limited to a practical application which produces a useful, tangible, and concrete result. See *Diehr*, 450 U.S. at 183-84, 209 USPQ at 6.

....

For eligibility analysis, physical transformation "is not an invariable requirement, but merely one example of how a mathematical algorithm [or law of nature] may bring about a useful application." *AT&T*, 172 F.3d at 1358-59, 50 USPQ2d at 1452. If the examiner determines that the claim does not entail the transformation of an article, then the examiner shall review the claim to determine if the claim provides a practical application that produces a useful, tangible and concrete result.

Applicants submit that claims 1-4 and 7-11 are process claims. Thus, according to the Guidelines, to be statutory the claims must either (a) result in a physical transformation for which a practical application is either disclosed in the specification or would have been known to a skilled artisan, or (b) be limited to a practical application which produces a useful, tangible, and concrete result.

The Examiner seemingly asserts that the claims are directed to non-statutory subject matter because they fail to result in a physical transformation (e.g., operating the nozzles, or applying the control solution to a nozzle matrix to effect desired force/torque). Contrary to the Examiner's assertion, however, the mere lack of resulting in a physical transformation does not necessarily render the claims non-statutory. That is, a claim may still be considered statutory if it is limited to a practical application which produces a useful, tangible, and concrete result.

Thus, by only addressing the physical transformation alternative, and by failing to explain how the claims do not produce a useful, tangible, and concrete result, the Examiner has failed to establish a *prima case* of unpatentability.

The Guidelines explicitly state that "[t]he burden is on the USPTO to set forth a *prima facie* case of unpatentability. Therefore if the examiner determines that it is more likely than not that the claimed subject matter falls outside all of the statutory categories, the examiner must provide an explanation." By only asserting that the claimed invention does not perform a physical transformation (e.g., operating the nozzles, or applying the control solution to a nozzle matrix to effect desired force/torque), the Examiner has failed to consider and explain how the claimed invention as whole does not produce a useful, tangible and concrete result. Therefore, the Examiner has failed to properly

establish a *prima facie* case of unpatentability, and the rejection should be withdrawn for at least this reason.

Even assuming *arguendo* that the Examiner has properly established a *prima facie* of unpatentability, which Applicants do not concede, Applicants submit that claims 1-4 and 7-11 are directed to statutory subject matter because they do produce a useful, tangible and concrete result as described below.

Useful Result

The guidance for the "useful result" prong of the §101 inquiry is provided by the following passage

For an invention to be "useful" it must satisfy the utility requirement of section 101. The USPTO's official interpretation of the utility requirement provides that the utility of an invention has to be (i) specific, (ii) substantial and (iii) credible. MPEP Sec. 2107... (Guidelines at Section IV).

Furthermore, the Examiner's attention is directed to MPEP §2107, which provides the following examination guidelines for the utility requirement

Office personnel are to adhere to the following procedures when reviewing patent applications for compliance with the "useful invention" ("utility") requirement of 35 U.S.C. 101 and 112, first paragraph.

(B) Review the claims and the supporting written description to determine if the applicant has asserted for the claimed invention any specific and substantial utility that is credible:

(1) If the applicant has asserted that the claimed invention is useful for any particular practical purpose (i.e., it has a "specific and substantial utility") and

the assertion would be considered credible by a person of ordinary skill in the art, do not impose a rejection based on lack of utility.

Applicants submit that the instant claimed invention complies with the above-noted provisions of MPEP §2107 because it is asserted in at least paragraphs 0002, 0009, and 0023 that the invention is useful for a particular purpose, *i.e.*, an optimal fuel solution. Accordingly, the claimed invention provides a useful result in terms of the §101 analysis.

Tangible Result

The guidance for the “tangible result” prong of the §101 inquiry is provided by the following passage from the Guidelines:

The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible requirement does require that the claim must recite more than a Sec. 101 judicial exception, in that the process claim must set forth a practical application of that Sec. 101 judicial exception to produce a real-world result. ... “[A]n application of a law of nature or mathematical formula to a . . . process may well be deserving of patent protection.” *Diehr*, 450 U.S. at 187, 209 USPQ at 8 (emphasis added); see also *Corning*, 56 U.S. (15 How.) at 268, 14 L.Ed. 683 (“It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent is granted ...”). In other words, the opposite meaning of “tangible” is “abstract.”

Applicants submit that independent claims 1 and 7 each, as whole, produce a tangible result. That is, claim 1 recites a method for the computer assisted determination of an optimum fuel-control of nozzles. Furthermore, claim 7 recites a

method to obtain optimum fuel usage for nozzles. Even further, the Examiner admits on page 5 of the Office Action that the claimed invention results in a "control solution".

Thus Applicants submit, as an optimal fuel solution results, the claimed method produces a beneficial result that is tangible, which by definition is the opposite of abstract. Accordingly, the claimed invention provides a tangible result in terms of the §101 analysis.

Concrete Result

The guidance for the "concrete result" prong of the §101 inquiry is provided by the following passage from the Guidelines:

Another consideration is whether the invention produces a "concrete" result. Usually, this question arises when a result cannot be assured. In other words, the process must have a result that can be substantially repeatable or the process must substantially produce the same result again. In re Swartz, 232 F.3d 862, 864, 56 USPQ2d 1703, 1704 (Fed. Cir. 2000) (where asserted result produced by the claimed invention is "irreproducible" claim should be rejected under section 101). The opposite of "concrete" is unrepeatable or unpredictable.

Applicants submit that independent claims 1 and 7 each, as whole, produce a concrete result. As noted above, the present invention provides an optimum fuel solution that is repeatable for the same input variables. While the solution may vary as input variables change, the results of the method are concrete. Therefore, Applicants submit the processes recited in the claims produce a result that is substantially repeatable. Accordingly, the claimed invention provides a concrete result in terms of the §101 analysis.

For at least the above-described reasons, Applicants submit that the claimed invention as a whole is directed to statutory subject matter because it produces a useful, tangible, and concrete result. Accordingly, Applicants respectfully request that the rejection over claims 1-4 and 7-11 under 35 U.S.C. §101 be withdrawn.

35 U.S.C. §112, First Paragraph, Rejection

Claims 1-4 and 7-11 were rejected under 35 U.S.C. §112, 1st paragraph. This rejection is respectfully traversed.

The Examiner asserts that the claimed method is essentially a "black-box" with no description of the internals thereof. The Examiner further asserts that there is insufficient description of the disclosure of the following claim features: (i) computer generating of starting constraints for a mass flow of the nozzles and of the minimization criterion; (ii) data processing a representation of a geometric description of the matrix transformation; (iii) searching, with a computer-assisted search procedure in the vector space, limiting point sets of the geometric description of the starting constraints; and (iv) applying the matrix transformation of minimization criterion to the points of the limiting point sets. Applicants respectfully disagree.

According to MPEP §2164.01, the test for enablement requires that the claimed invention be enabled so that any person skilled in the art can make and use the invention without undue experimentation. *In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988). Moreover, the Guidelines state that "USPTO personnel must always remember to use the perspective of one of ordinary skill in the art. Claims and disclosures are not to be evaluated in a vacuum. If elements of an invention are well

known in the art, the applicant does not have to provide a disclosure that describes those elements.”

Applicants submit that the above-noted features *i* – *iv* are sufficiently described in the specification such that a person skilled in the art can make and use the invention without undue experimentation. Specifically, item *i* is described in paragraphs 0036 and 0052 – 0054, item *ii* is described in paragraphs 0037 – 0040 and 0055 – 0059, item *iii* is described in paragraphs 0041 – 0046 and 0060 – 0061, and item *iv* is described in paragraphs 0047 – 0048 and 0062 – 0069 of the specification.

Moreover, Applicants submit one ordinarily skilled in the art reviewing the original disclosure would readily understand the invention and would be able to make and use the same. Thus, Applicants submit the rejection for lack of enablement is improper.

Accordingly, Applicants respectfully request that the rejection over claims 1-4 and 7-11 under 35 U.S.C. §112, 1st paragraph, be withdrawn.

35 U.S.C. §112, Second Paragraph, Rejection

Claims 1-4 and 7-11 were rejected under 35 U.S.C. §112, 2nd paragraph. This rejection is respectfully traversed.

The Examiner asserts that the following features are unclear: (*i*) computer generating of starting constraints for a mass flow of the nozzles and of the minimization criterion; (*ii*) data processing a representation of a geometric description of the matrix transformation; (*iii*) searching, with a computer-assisted search procedure in the vector space, limiting point sets of the geometric description of the starting constraints; and (*iv*)

applying the matrix transformation of minimization criterion to the points of the limiting point sets. Applicants respectfully disagree.

According to MPEP § 2173.02, the test for definiteness under 35 U.S.C. 112, second paragraph, is whether "those skilled in the art would understand what is claimed when the claim is read in light of the specification." *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986).

Definiteness of claim language must be analyzed, not in a vacuum, but in light of: (A) the content of the particular application disclosure; (B) the teachings of the prior art; and (C) the claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

Applicants submit that the above-noted features *i* – *iv* are sufficiently described in the specification such that a person skilled in the art would understand what the claimed invention is when the claims are read in light of the specification. Specifically, Applicants note that item *i* is described in paragraphs 0036 and 0052 – 0054, item *ii* is described in paragraphs 0037 – 0040 and 0055 – 0059, item *iii* is described in paragraphs 0041 – 0046 and 0060 – 0061, and item *iv* is described in paragraphs 0047 – 0048 and 0062 – 0069 of the specification.

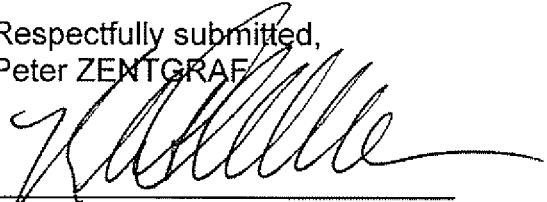
Thus, Applicants submit one ordinarily skilled in the art reviewing the original disclosure and pending claims would understand the instant invention and readily ascertain the scope of the invention. Therefore, Applicants submit the instant rejection is improper.

Accordingly, Applicants respectfully request that the rejection over claims 1-4 and 7-11 under 35 U.S.C. §112, 2nd paragraph, be withdrawn.

CONCLUSION

In view of the foregoing remarks, Applicants submit that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicants hereby make a written conditional petition for extension of time, if required. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 19-0089.

Respectfully submitted,
Peter ZENTGRAF



Neil F. Greenblum
Reg. No. 28,394

October 5, 2006
GREENBLUM & BERNSTEIN, P.L.C.
1950 Roland Clarke Place
Reston, VA 20191
(703) 716-1191